

REMARKS

Claims 1, 5-9, 11, 15-17, 19, 21, 22, 24 and 26 are pending in this application. By this Amendment, claims 1, 5-8, 11, 17, 19, 21, 22, 24 and 26 are amended and claims 2, 18, 20, 23 and 25 are canceled. Support for the amendments to the claims may be found, for example, in the original claims. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Personal Interview

The courtesies extended to Applicant's representative by Examiner McDonald during the interview held March 16, 2010, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below, which constitute Applicant's record of the interview.

II. Rejections Under 35 U.S.C. §103

A. Mitsui And Watanabe

The Office Action rejects claims 1, 2, 5, 7, 8, 9, 11, 15, 19, 20 and 23-26 under 35 U.S.C. §103(a) as having been obvious over U.S. Patent No. 5,942,356 to Mitsui et al. ("Mitsui I") in view of JP 2001-303243 to Watanabe et al. ("Watanabe"). By this Amendment, claims 2, 20, 23 and 25 are canceled, rendering their rejection moot. As to the remaining claims, Applicant respectfully traverses the rejection.

By this Amendment, claim 1 recites "a method for manufacturing a mask blank having a light semi-transmitting film for forming a mask pattern on a transparent substrate" where "the sputtering target has a hardness of 1100 HV or more in Vickers' hardness" and a "metal comprised in the sputtering target is molybdenum or tungsten." Claims 8 and 11 recite similar features. The applied references do not disclose and would not have rendered obvious these claim features for at least the following reasons.

The Office Action, at pages 2-3, asserts that Mitsui I teaches a method for manufacturing a mask blank having a thin film for forming a mask pattern on a substrate. The Office Action further asserts that the thin film is formed by a sputtering method using a target comprising metal and silicon, and sputtering is done by reactive sputtering in an atmosphere of at least one of oxygen gas and nitrogen gas. The Office Action acknowledges that Mitsui I does not disclose the Vickers' hardness range of the claimed method. The Office Action however asserts that Watanabe cures this deficiency because Watanabe teaches using a metal silicide target with a Vickers' hardness of 1300 or less to produce thin films without defects. Applicant respectfully disagrees for at least the following reasons.

The Office Action, at page 8, asserts that an ordinarily skilled artisan would combine Mitsui I and Watanabe because both references suggest using the same silicide target material to produce thin films. Applicant respectfully disagrees. Mitsui I discloses a method of forming a thin film by a reactive sputtering method under an atmosphere comprising oxygen or nitrogen. See Mitsui I, Abstract. In contrast, Watanabe discloses a method of producing films by an ordinary sputtering method under Ar atmosphere.

Only inert gases may be used in the ordinary sputtering method of producing films. Reactive gases, such as oxygen and nitrogen, cannot be used in the ordinary sputtering method. Additionally, a film formed by a reactive sputtering method (Mitsui I) would result in a sputtering film having high insulating properties because oxygen and nitrogen in the atmosphere would react with the metal and silicon sputtered from the target. In contrast, a film formed by an ordinary sputtering method (Watanabe) would result in a conductive silicide film having reflective properties from being formed. Thus, an ordinarily skilled artisan would not have combined the methods of Mitsui I and Watanabe because the references teach completely different reaction pathways resulting in sputtering films having completely different physical properties.

The Office Action, at page 8, asserts that an ordinarily skilled artisan would combine Mitsui I and Watanabe because "Watanabe recognizes that a specific hardness for a metal and silicon containing target for producing films is desired in order to reduce defects"

Applicant respectfully disagrees. An ordinarily skilled artisan would not have had any reason or rationale to form a thin film comprising a sputtering target having a hardness of 1100 HV or more in Vickers' hardness. This range reduces defects caused by the generation of particles during reactive sputtering due to oxygen, which reduces discharge stability. See specification at paragraphs [0016], [0023] and [0029]. Thus, the "1100 HV or more" Vickers' hardness range is a solution to a problem (i.e., oxygen in the atmosphere) that causes defects (i.e., generation of particles) in the sputtering film. As acknowledged by the Office Action, Mitsui I does not disclose a Vickers' hardness range. Watanabe does not teach that oxygen in the atmosphere is a problem that causes the generation of particles in sputtering film because, as discussed above, Watanabe teaches forming sputtering film by an ordinary sputtering method under Ar atmosphere. Thus, an ordinarily skilled artisan would not have had any reason or rationale to modify the thin film of Mitsui I in view of Watanabe to have a sputtering target with a Vickers' hardness of "1100 HV or more."

Additionally, Watanabe and the present application are directed to different technical fields. The present application is directed to a mask blank having a light semi-transmitting film, which is an optical component. Thus, the claimed features affect optical properties such as transmittance, amount of phase shifts, and refractive index. In contrast, Watanabe is directed to materials used in electrical wirings or electrodes, which are electronic components. Thus, features disclosed in Watanabe affect electrical properties, such as electric resistance and conductivity. During manufacturing of a light semi-transmitting film under a reactive sputtering method, reactive sputtering gases, such as oxygen and/or nitrogen, are used in order to control the phase difference and the transmittance of the light semi-transmitting film. On

the other hand, reactive gases, such as oxygen and/or nitrogen, are never used in the manufacturing of electrical wirings or electrodes of semiconductor devices. Thus, an ordinarily skilled artisan would not have had any reason or rationale to apply the teachings of Watanabe to achieve the claimed method for manufacturing a mask blank having a light semi-transmitting film.

For at least these reasons, the applied references would not have rendered obvious claims 1, 8 and 11. Claims 5, 7, 9, 15, 19, 24 and 26 depend from claims 1 and 8 and, thus, also would not have been rendered obvious by the applied references for at least the same reasons. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Remaining Claims

The Office Action rejects:

- 1) Claim 6 under 35 U.S.C. §103(a) as having been obvious over Mitsui I in view of Watanabe and further in view of JP 07-128840 to Okubo ("Okubo I");
- 2) Claims 17 and 18 under 35 U.S.C. §103(a) as having been obvious over Mitsui I in view of Watanabe and further in view of U.S. Patent No. 5,935,735 to Okubo et al. ("Okubo II");
- 3) Claim 16 under 35 U.S.C. §103(a) as having been obvious over Mitsui I in view of Watanabe and further in view of U.S. Patent No. 4,938,798 to Chiba et al. ("Chiba"); and
- 4) Claims 21 and 22 under 35 U.S.C. §103(a) as having been obvious over Mitsui I in view of Watanabe and further in view of U.S. Patent No. 6,087,047 to Mitsui et al. ("Mitsui II").

By this Amendment, claim 18 is canceled, rendering its rejection moot. As to the remaining claims, Applicant respectfully traverses the rejections.

Claims 6, 16, 17, 21 and 22 variously depend from claims 1 and 8 and, thus, contain all the features of claims 1 or 8. Deficiencies of Mitsui I and Watanabe with respect to claims 1 and 8 are discussed above. Okubo I, Okubo II, Chiba and Mitsui II, which are applied by the Office Action for additional features recited in the above-identified claims, do not cure deficiencies of Mitsui I and Watanabe with respect to claims 1 and 8.

Thus, the applied references would not have rendered obvious claims 6, 16, 17, 21 and 22. Accordingly, reconsideration and withdrawal of the rejections are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Petition for Extension of Time

Date: March 26, 2010

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